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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,575	03/28/2001	Zvi Yona	P-3068-US	3666
27130	7590	04/28/2005	EXAMINER	
EITAN, PEARL, LATZER & COHEN ZEDEK LLP 10 ROCKEFELLER PLAZA, SUITE 1001 NEW YORK, NY 10020			CHANG, AUDREY Y	
			ART UNIT	PAPER NUMBER
			2872	
DATE MAILED: 04/28/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

11A

Office Action Summary	Application No. 09/818,575	Applicant(s) YONA ET AL.	
	Examiner Audrey Y. Chang	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on February 28, 2005, which has been entered into the file.
- By this amendment, the applicant has amended claims 1, 8, 10, 17, 19, 25, and 28.
- Claims 1-38 remain pending in this application.
- The objections to claims 25 and 28 set forth in the previous Office Action are withdrawn in response to applicant's amendment.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 1-7, 9-16 and 18-38 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The reasons for rejection have been set forth in the previous Office Action.

The feature "a redirecting unit coupled to said image source direct ... to ... spatial regions of a reflecting unit based on said different optical property", recited in claims 1, 17, and 19, wherein the optical property is referred in the earlier part of the claims as polarization or wavelength. However the

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specification and the claims fail to teach that the *reflecting unit* being a *diffractive* optics or a *hologram*, as recited in claims 2-4, 11-13 and 20-23 when the property is polarization. A simple reflective unit, such as mirror, is used in the polarized image light. The diffractive optical element and the hologram disclosed in the instant application cannot diffract light based on different polarization state.

In response to applicant's arguments which states that the cited specification (page 8, lines 10-21 and page 9 lines 1-5), provides the teachings of the reflective unit concerning the polarization property, the examiner disagrees since there is no teachings concerning the polarization property at all is disclosed. It is not clear how does the reflective unit reflect light based on different polarization property of the complimentary images.

The specification and the claims fail to teach how could the redirecting unit being a *polarization selective* reflective device that is capable of "directing at least said first and second images to at least first and second respective spatial region of a reflecting unit". Clarifications are required. It is known in the art that a polarization selective reflective device to the most can **only reflect** light with one particular polarization state; it will not be able to **redirect** light along common optical axis, (as required by the amended claims 1, 10 and 19) into *different directions*, unless certain specific structure is designed to do so, and the *specific structure is essential* to enable the function. Furthermore, the polarization selective reflective device can only reflect "polarized light" where no such feature is being defined in the claims for the image, this therefore makes the apparatus not enabling. The applicant is respectfully noted that polarizability is different from reflectivity. Polarizability along will not be able to reflect light of different polarization to different spatial regions.

In response to applicant's argument which specifically states that "a wedge with two polarization dependent reflective planes each for reflecting light of a different polarization would operate to direct light polarized differently in different direction" the applicant is respectfully advised that this argument does not overcome the rejection since it is not explicitly stated in the

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claims. The wedge structure with two polarization dependent reflective surfaces is the essential structure for making the apparatus operable however it is not explicitly stated in the claims.

The specification and claims also fail to teach how could an image source is capable of generation spatial complementary image that are of different wavelength or of different polarization. *Certain essential elements, that are critical, are needed to achieve such features, for instance different image generators for generating different image with different wavelength or polarization coding scheme and a combiner to combine the image. Claims 34 and 36 fail to provide the essential element of coding the two images to have the different wavelength or polarization property.*

In response to applicant's arguments that features that are not explicitly stated in the claims cannot be relied upon to overcome the rejections.

The specification and the claim fail to teach how could a wavelength sensitive device work as the *redirecting* unit. The claims fail to teach the wavelength property of the images to make the "wavelength sensitive device" workable in the apparatus claimed. The specification and the claims also fail to teach how could it be by simply having "wavelength sensitive" the redirecting unit is capable of directing first and second complementary images to different spatial location, according to wavelength. Color-coding in general will not give different reflection direction.

In response to applicant's arguments that features that are not explicitly stated in the claims cannot be relied upon to overcome the rejections. A wavelength sensitive device that is lacking any optical function cannot "redirect" the image light to different directions or locations.

Clarifications are required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7, 9-16, 18-23, 35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to patent issued to Preston (PN. 6,094,283).

Preston teaches a *holographic display* that is comprised of an *image source* (30, Figure 1) to produce at least a *first and second complementary images* along a *common optical axis* wherein the complementary images are differing in *wavelength*, (i.e. the image comprises red, green and blue complementary image). The display further comprises a *relay optics* (32) having a field of view associated with it, a *redirecting unit* (34 and 36) coupled to the image source for directing the complementary images to at least a first and second respective spatial regions of a *reflecting units* (38) *based on the wavelength property* of the complementary images, wherein the images are reflected by the reflecting unit such that a single eye of the observer is capable of viewing **an integrated image** from the complementary images. Preston teaches that the redirecting unit (34 and 36) each comprises a *stack of red, green and blue holograms* (60, 62 and 64) that redirects **only** the red, green and blue component or complementary image, *respectively* which means the redirection is based on wavelength property. The reflecting unit or the eyepiece (38) is also comprised of a *stack of red, green and blue holograms* that are *spatially separated* from each other, (please Figure 7), this means that different wavelength components or complementary images are reflected by different holograms at *different* spatial locations.

This reference has met all the limitations of the claims with the exception that it does not teach *explicitly* that the field of view of the integrated image is wider than the field of view of the relay optics. However this is either *inherently* included in the geometric relationships among the different optical elements as demonstrated by Figure 1 wherein the final integrated image appears to have a greater field of

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view than the field of view of the relay optics or an obvious modification to one skilled in the art to obtain a wider view, (please see Figure 1 and columns 2-7).

Claims 1, 10, and 19 have been amended to include the feature that the “*redirecting unit coupled to direct at least said first and second image to at least first and second different respective spatial regions of a reflecting unit*”. **Preston** teaches that the redirecting unit (34 and 38) comprises *stacks of spatially adjacent holograms* that each of the hologram **only** redirects either red, green or blue image to *specific* spatial location of the reflective unit (38) which again is comprised of *stacks of hologram* (red, blue and green holograms) that are *adjacently arranged* so that each of the holograms will **only reflect** red, blue or green color complimentary images to the single eye of the observer, (please see Figure 1). Figure 1 specifically demonstrated that the redirect unit (34 and 36) redirects the images to *spatially different regions* of the reflective unit (38). The stack arrangement of the red, green and blue holograms in each of the redirecting unit and the reflective unit *requires* that the red, blue and green images be redirected to *different spatial regions* of the reflective unit, namely to the red, blue and green holograms respectively in order for the images to be reflected to the eye position.

With regard to claims 2-4, 11-13, and 20-23, the reflecting unit or the eyepiece (38) is a diffractive holographic element having optic power for converging the complementary images to form a composite or integrated image. Although this reference does not teach explicitly that the holographic optical element is a binary optics such feature is either inherently met by the disclosure or an obvious modification to one skilled in the art for the benefit of providing an alternatively well known type of diffractive element that have good diffraction efficiency. **Preston** teaches that the image display apparatus could be applied as *head mount display*, (with respect to claim 10 also), which implicitly requires the observer being capable of viewing the surrounding scene also. Although this reference does not teach explicitly to make the power of the holographic optical element to have zero optical power for

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surrounding scene by providing a corrector hologram, however such practice is standard in the art for the benefit stated above, such modification would therefore have been obvious to one skilled in the art.

With regard to claims 5-6, 14-15, 24, 27, and 31, Preston teaches that the number of complementary images is at least three and the images are different in color or wavelength. The reflecting unit (38) is wavelength selective.

With regard to claims 7, 9, 16, 18 and 30, this reference however does not teach explicitly that the complementary images are different in polarization state and the redirecting unit is polarization selective reflecting device. However the instant application fails to provide an operable model using polarization mode in the claims, it therefore cannot be examined with details. It would have been obvious to one skill in the art to make the holograms (60, 62 and 64) polarization selective so that different polarization states of the image light will be redirected and reflected by holographic elements (34, 36 and 38) independently. Polarization selective hologram is very well known in the art.

With regard to claims 25-26, 28-29, 32-33, 35, and 37, Preston teaches that the different color components of the image or the complementary images are *simultaneously* generated and they are not overlapping at the eyepiece since different hologram is responsible to reflect a complementary image of particular wavelength. Although this reference does not teach that the complementary images can also be generated sequentially, such modification is considered to be an obvious matters of design choice to one skilled in the art for it basically operates the same as simultaneously generation.

5. Claims 34, 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Preston as applied to claims 1, 10 and 19 above, and further in view of the patent issued to Chauvin (PN. 5,198,928).

The holographic image display taught by Preston as described for claims 1, 10 and 19 above has met all the limitations of the claims. This reference teaches that the images are generated by image

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source (30) but does not teach explicitly that the images are generated using two image sources and a combiner. However such arrangement is rather well known in the art to generate a combined image with different coding of the image components, as taught by Chauvin. Chauvin teaches an apparatus to generate an image along a single optical axis wherein the image comprises two image components each of different polarization state, wherein two image sources (22 and 24) are used to generate a pair of image component wherein a pair of polarizers (26 and 28) is used to polarize the image components to have different polarization state and a combiner (30) is used to combine the two image components, (please see Figure 1). It would then have been obvious to one skilled in the art to apply the teachings of Chauvin to modify the image source for the benefit of generating the image with different coding of each image components.

6. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Florence et al (PN. 5,652,666).

Florence et al teaches a *holographic display system* that is comprised of a *spatial light modulator* (14, Figure 4), for generating a *plurality of stripes of image* representing a hologram, that serves as the *at least first and second complementary images*, with no significant portions being overlapped with each of the stripe of images, (please see Figure 4). The display system further comprises a set of lenses (41-43) serves as the **relay optics** with associated field of view for directing the complementary images to a scanning mirror (45) that is rotatable for redirecting the stripes of image to a *cylindrical lens* (44) to form an **integrated hologram image** at an image plane (46). This reference has met all the limitations of the claims with the exception that it does not teach explicitly to use a reflecting unit as the means for forming the integrated image. However to use a transparent lens or a reflective mirror for converging image light to form image is rather well known in the art such modification would have been obvious to one skilled in the art for the benefit of providing a different and more compact optical design to the display system.

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Claims 8 and 17 have been amended to include the feature that the “*redirecting unit coupled to direct at least said first and second image to at least first and second different respective spatial regions of a reflecting unit*”. Florence et al teaches that the redirect unit is a scanning mirror that is rotatable so that each of the image segments (or strip images) is reflected and redirected to the *proper* spatial locations of the lens (44) and therefore to the observer area (46) in order to form a *composite* image. It is essentially true that in order for the image segments or image strips to be directed to the *proper segment locations* at the observer or image plane to form a *composite* image, the image segment has to be direct to *different* spatial location via the scanning mirror to the image forming means, (the motion of the scanning mirror achieves such different spatial location requirement).

Response to Arguments

7. Applicant's arguments filed February 28, 2005 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and they are rejected for the reasons stated above.

8. Applicant's arguments concerning the rejections based on 35 USC 112, first paragraph, have been fully addressed in the paragraphs above.

9. In response to applicant's arguments which states the cited Preston reference teaches that the each input image display 40 display a single image in its color components and not two *different* image, this same single image is reconstructed at the same area of the eye pieces (38) which therefore differs from the instant application, the examiner respectfully disagrees for the reasons stated below. **Firstly**, Preston teaches that the input image display is capable of *sequentially* generates red, green and blue *images* into the system, (sequentially means one color image at a time). These red, green and blue images are exactly the “*at least first and second complimentary image differing in at least one optical property selected from the group consisting of polarization and wavelength*” as recited in the claims. The claims only require the

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images to be *complimentary differs in color* or wavelength which is *exactly* the case of the Preston.

Secondly, any one skilled in the art would understand that the color images generated by the image display of Preston's apparatus **cannot** be reconstructed at the same areas of the eyepiece (38), since the relay optics (34 and 36) and the eyepieces optics (38) each is comprised of a *stack* of red, green and blue *holograms*, (stack means that are arranged *different in spatial locations*) and the holograms are *wavelength selective*, namely the red hologram will *only* be able to redirect, reconstruct and reflect the *red color image* and will pass all other color images *without* any optical action. The same is for other color holograms. This means the different color complimentary images cannot be reconstructed, redirected and reflected at same area of the eyepieces but they have to be at *different spatial locations* or at *different holograms* in order for the display apparatus to work. This reference therefore reads on the instant application.

10. Applicant's arguments concerning *rotational mirror means* or the *wedge means* having different polarization sensitive reflective surfaces to redirect the first and second complimentary images of different polarization state to the different spatial locations on the reflective unit are not persuasive to overcome the rejection since the features are not stated in the claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing

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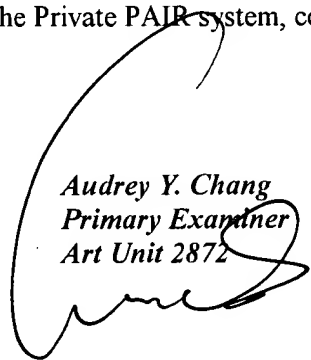
date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Audrey Y. Chang
Primary Examiner
Art Unit 2872



A. Chang, Ph.D.